REMARKS

The Applicants note that claims 41-45 are indicated as being allowed in the Office Action Summary.

Claims 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyazono, *et al.* (United States Patent Number 5,912,867). Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hideyasu (Japan Publication Number 2000348354) in view of Hashimoto, *et al.* (United States Patent Number 4,328,579). Claims 15-17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hideyasu in view of Applicant Admitted Prior Art (AAPA). Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hideyasu, in view of Katayama, *et al.*, and further in view of Ishibashi, *et al.*(United States Patent Number 5,848,036). In view of the amendments to the claims and the following remarks, the rejections are respectfully traversed, and reconsideration of the rejections is respectfully requested.

In the present invention as claimed in claim 24, a focus search method comprises receiving a focus OK signal and determining a logic state of the focus OK signal and generating waveforms for a focus search having different slopes based on the determination result.

In the present invention as claimed in claims 25 and 26, a focus search method comprises receiving a focus OK signal, and, if the focus OK signal is logic "low", generating a waveform for the focus search having a first slope, and, if the focus OK signal is logic "high", generating a waveform having a second slope.

Miyazono, *et al.* teaches detecting a FOK signal during a focus search (see Miyazono, *et al.*, column 11, line 9 through column 12, line 6). The Office Action refers to Figure 9 of Miyazono, *et al.* as teaching generating waveforms for a focus search. However, while the FOK signal of Miyazono, *et al.* can be in a logic LOW state (see, for example, Miyazono, *et al.*, column 11, lines 38-40), or in a logic HIGH state (see, for example, Miyazono, *et al.*, column 15, lines 6-8), the waveforms shown in Figure 9 of Miyazono, *et al.* are generated independently of the logic state of the FOK signal. For example, the slope of the waveform shown in Figure 9(d) of Miyazono, *et al.* is unrelated to the abovementioned logic states of the FOK signal shown in Figure 9(b). In another example, the slope of the waveform shown in Figure 15(a) is unrelated to the logic states of the FOK signal shown in Figure 15(b). There is no teaching or suggestion in Miyazono, *et al.* of a focus search method comprising generating waveforms for a focus search having different slopes based on the determination result of a logic state of a focus OK signal, as claimed in independent claim 24. Further, there is no teaching or suggestion in Miyazono, *et al.* of a focus search method comprising receiving a focus OK signal, and, if the focus OK signal is logic "low", generating a waveform for the focus search having a first slope, and, if the focus OK signal is logic "high", generating a waveform having a second slope, as claimed in independent claim 25.

It is therefore submitted that Miyazono, *et al.* fails to teach or suggest the invention set forth in claims 24-26. Therefore, reconsideration of the rejections of claims 24-26 under 35 U.S.C. § 102(b) based on Miyazono, *et al.* is respectfully requested.

In the present invention as claimed in claims 1-3, a focus search method includes generating a sine wave in response to a focus search command and performing a focus search by an optical pickup outputting a focus error signal in response to the sine wave. The sine wave is generated independently of the focus error signal. The sine wave is digitally generated from an impulse signal by using a plurality of multipliers, a plurality of adders and a plurality of delay units.

In the present invention as claimed in claims 4-6, a focus search method includes generating a sine wave and performing a focus search using an optical pickup that outputs a focus error signal and ascends or descends toward or from an optical disc in response to an amplitude of the sine wave. The sine wave is generated independently of the focus error signal. The sine wave is digitally generated from an impulse signal by using a plurality of multipliers, a plurality of adders and a plurality of delay units.

In the present invention as claimed in claims 7 and 8, a focus search method includes performing a focus search using an optical pickup that outputs a focus error signal and that ascends and descends toward or from an optical disc in response to an amplitude of a sine wave generated by a sine wave generator. The sine wave is generated independently of the focus error signal. The sine wave is digitally generated from an impulse signal by using a plurality of multipliers, a plurality of adders and a plurality of delay units.

Hideyasu discloses a method in which a focus servo pull-in is executed around the center of oscillation of an objective lens. In Hideyasu, a switch SW2 is changed over to a compensation circuit 11 from a sine wave generating circuit 12 in response to a signal from a pull-in control circuit 21. The pull-in control circuit 21 generates focus error zero-cross signal in response to a focus error signal from a focus error detecting circuit 14 and an RF signal which is the total reflected light obtained by a reflected light detecting circuit 15. The compensation circuit 11 receives the focus error signal from the focus error detecting circuit. The pull-in control circuit 21 includes a pulse period detector 27. The pulse period detector 27 includes a low pass filter LPF.

In Hideyasu there is no teaching or suggestion in of how the sine wave generating circuit 12 generates the sine wave.

The Office Action states at page 8, paragraph 3 that the applicant argues that Hashimoto, *et al.* that does not disclose a "sine wave using a plurality of multipliers, a plurality of adders and a plurality of delay units." However, in the Amendment C dated February 15, 2008, the applicants argued Hashimoto, *et al.* fails to teach or suggest a focus search method in which a sine wave is digitally generated from an impulse signal by using a plurality of multipliers, a plurality of adders and a plurality of delay units, as claimed in claims 1-3, 4-6 and 7-8. While the digital sine-wave generator 15 of Hashimoto, *et al.* includes multipliers 44a-d, adders 45 and 47 and delay units 43 and 46, there is no teaching or suggestion in Hashimoto, *et al.* that a sine wave is digitally generated from an impulse signal as claimed. Instead, Hashimoto, *et al.* discloses that the sine-wave generator 15 generates a sine wave based on the digital signal B. There is no teaching or suggestion that the digital signal is an impulse signal as claimed. Rather, the digital signal represents input information A to be transmitted with a voice signal.

In addition, the Office Action further states at page 8, paragraph 3 that Hashimoto, *et al.* is cited to disclose only the structures or components of a sine wave generator and is then combined with Hideyasu, which discloses a focus servo apparatus which generates a sine-wave automatically. However, the Applicants note that if the components of Hashimoto, *et al.* were applied to Hideyasu to generate the sine wave, then the sine-wave signal in Hideyasu would not generate a sine wave automatically when input information is inputted to the sine wave generator. Rather, like in Hashimoto, *et al.*, in Hideyasu, the sine-wave signal would not be generated automatically when the input information A is inputted.

Therefore, the combination of Hideyasu and Hashimoto, *et al.* fails to teach or suggest a focus search method in which a sine wave is digitally generated from an impulse signal by using a plurality of multipliers, a plurality of adders and a plurality of delay units, as claimed in claims 1-3, 4-6 and 7-8.

Hence, neither of Hideyasu and Hashimoto, *et al.* teaches or suggests certain elements of the present invention set forth in claims 1-3, 4-6 and 7-8. Specifically, neither of Hideyasu and Hashimoto, *et al.* teaches or suggests a focus search method in which a sine wave is digitally generated from an impulse signal by using a plurality of multipliers, a plurality of adders and a plurality of delay units, as claimed in claims 1-3, 4-6 and 7-8. Accordingly, there is no combination of the references which would provide such teaching or suggestion.

Neither of the references, taken alone or in combination, teaches or suggests the invention set forth in claims 1-3, 4-6 and 7-8. Therefore, it is believed that claims 1-3, 4-6 and 7-8 are allowable over the cited references, and reconsideration of the rejections of claims 1-8 under 35 U.S.C. § 103(a) based on Hideyasu and Hashimoto, *et al.* is respectfully requested.

In the present invention as claimed in independent claim 15, a focus search method includes receiving, low-pass filtering, and outputting a signal output from a focus loop filter during a focus-on, and adding a waveform for a focus search and the low-pass filtered signal during the focus search, and wherein the focus search starts from the low-pass filtered signal.

With regard to independent claim 15, the Office Action states at page 8, line 19 through page 9, line 2, that that the AAPA discloses a focus loop filter and that Hideyasu discloses a low pass filter. In Hideyasu, the low-pass filter 34 is within a pulse period detector which is within a pull-in control circuit 21. The pull-in control circuit 21 controls the switch SW2 by changing over to a compensation circuit 11 from a sine wave generating circuit 12. The pull-in control circuit 21 generates a focus error zero-cross signal which controls the switch SW2. The output of the low-pass filter 34 of Hideyasu is in no way added to the output of the sine wave generator. In addition, the low pass filter 34 of Hideyasu does not receive a signal output from a focus loop filter as claimed, as Hideyasu in no way teaches or suggest a focus loop filter. While the AAPA discloses a focus loop filter, there is no teaching or suggestion that the output of the focus loop filter is low pass filtered. The low pass filter 34 of Hideyasu is used to acquire a focal zero cross signal of a fixed period, which is then output to the switch SW2. The low-pass filter 34 of Hideyasu would not be applied to the focus loop filter of the AAPA. While Hideyasu discloses a low-pass filter and the AAPA discloses a focus loop filter, there is no teaching or suggestion in either Hideyasu or the AAPA of applying a low pass filter to the output of the focus loop filter of the AAPA or of adding the output of the low pass filter 34 of Hideyasu to a waveform for a focus search. Further, there is no teaching or suggestion in Hideyasu or the AAPA of starting a focus search from a low-pass filtered signal.

Therefore, it follows that the combination of Hideyasu and the AAPA fails to teach or suggest a focus search method that includes receiving, low-pass filtering, and outputting a signal from a focus loop filter during a focus-on, as claimed in claims 15-18. In addition, the combination of Hideyasu and the AAPA fails to teach or suggest a focus search method that includes adding a waveform for a focus search and a low-pass filtered signal during the focus search, as claimed in claims 15-18. In addition, the combination of Hideyasu and the AAPA fails to teach or suggest a focus search method that includes a focus search which starts from a low-pass filtered signal, as claimed in claims 15-18. Neither of Hideyasu and the AAPA teaches or suggests the above limitations of claims 15-18, and the combination of Hideyasu and the AAPA would not teach or suggest the above limitations of claims 15-18.

In the present invention as claimed in claim 19, a focus search method includes driving an optical pickup in response to a signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup.

In the present invention as claimed in claim 20, a focus search method includes calculating an average value for the signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and the average value.

The Office Action states at page 8, line 19 through page 9, line 2, that, in regards to claims 15, 19 and 20, applicant argues that the AAPA does not disclose low-pass filtering during a focus on. However, the Applicants note that in Amendment C dated February 15, 2008, the applicants did not make this argument with regard to claims 19 and 20. The arguments with regard to claims 19 and 20 in Amendment C dated February 15, 2008 are repeated below for the convenience of the Examiner.

> With regard to independent claim 19, Hideyasu fails to teach or suggest a focus search method that includes, if a focus drop occurs after a focus-on and a focus search is performed, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup, as claimed in claim 19. Hideyasu does not teach or suggest the outcome if a focus search is unsuccessful. As stated in Amendment B, dated July 30, 2007, instead, in Hideyasu, there is no teaching or suggestion of a focus drop. Therefore, there is no teaching or suggestion in Hideyasu of performing the focus search from the signal output from the focus loop filter prior to the focus drop.
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> With regard to independent claim 20, Hideyasu fails to teach or suggest a focus search method that includes, if a focus drop occurs after a focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and an average value for the signal output from a focus loop filter, as claimed in claim 20. Hideyasu does not teach or suggest the outcome if a focus search is unsuccessful. As stated in Amendment B, dated July 30, 2007, instead, in Hideyasu, there is no teaching or suggestion of a focus drop. Therefore, there is no teaching or suggestion in Hideyasu of performing the focus search from the signal output from the focus loop filter prior to the focus drop. In addition, in Hideyasu, the output of the waveform from FIG. 5B is in no way added to a waveform that is used for a focus search, as claimed. In addition, in Hideyasu, the sine wave signal generated by the sine wave generating circuit 12 is not added to any signal.
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> In the AAPA, a focus loop filter 30 receives a focus error signal FE output from the optical pickup 20 and outputs a focus output drive signal FOD for a focus servo to an actuator mounted in the optical pickup 20 in response to the focus error signal FE. In the AAPA, in an event that a focus drop occurs due to an external impact when performing a focus search, a focus search apparatus performs the focus search again from the start.
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> With regard to independent claim 19, like Hideyasu, the AAPA fails to teach or suggest a focus search method that includes, if a focus drop occurs after a focus-on and a focus search is performed, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup, as claimed in claim 19. In the AAPA, in an event that a focus drop occurs due to an external impact when performing a focus search, a focus search apparatus performs the focus search again from the start, without regard to any previous outputs of a the focus loop filter.
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> With regard to independent claim 20, like Hideyasu, the AAPA fails to teach or suggest a focus search method that includes, if a focus drop occurs after a focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and an average value for the signal output from a focus loop filter, as claimed in claim 20. There is no

> teaching or suggestion in the AAPA that an average value of the focus output drive signal FOD output from the focus loop filter 30. In addition, there is no teaching or suggestion that any signal is added to the waveform for the focus search. Further, in the AAPA, in an event that a focus drop occurs due to an external impact when performing a focus search, a focus search apparatus performs the focus search again from the start, without regard to an average value of the output from the focus loop filter.

Hideyasu does not disclose a focus loop filter, and, in Hideyasu, there is no teaching or suggestion of performing a focus search again from a previously input signal. In addition, while the AAPA discloses a focus loop filter, there is no teaching or suggestion of performing a focus search again from a previously input signal. Therefore, the combination of Hideyasu and the AAPA would not teach or suggest performing a focus search again from a previously input signal, i.e. the output of the focus loop filter, as claimed.

Hideyasu and the AAPA fail to teach or suggest elements of the invention set forth in claims 15-18, 19 and 20, as noted above. Specifically, neither of Hideyasu and the AAPA teach or suggest a focus search method that includes receiving, low-pass filtering, and outputting a signal from a focus loop filter during a focus-on, adding a waveform for a focus search and a low-pass filtered signal during the focus search, a focus search which starts from a low-pass filtered signal, as claimed in claims 15-18. In addition, neither of Hideyasu and the AAPA teach or suggest a focus search method that includes, if a focus drop occurs after a focus-on and a focus search is performed, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup, as claimed in claim 19. Further, neither of Hideyasu and the AAPA teach or suggest a focus search method that includes, if a focus drop occurs after a focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and an average value for the signal output from a focus loop filter, as claimed in claim 20. Accordingly, there is no combination of the references which would provide such teaching or suggestion. Neither of the references, taken alone or in combination, teaches or suggests the invention set forth in claims 15-18, 19 and 20. Therefore, it is believed that claims 15-18, 19 and 20 are allowable over the cited references, and reconsideration of the rejections of claims 15-17, 19 and 20 under 35 U.S.C. § 103(a) based on Hideyasu and the AAPA is respectfully requested.

With regard to the rejection of claim 18 based on the combination of Hideyasu, Katayama, *et al.*, and Ishibashi, *et al.*, it is submitted that Katayama, *et al.*, and Ishibashi, *et al.*, like Hideyasu, fail to teach or suggest a focus search method that includes receiving, low-pass filtering, and outputting a signal from a focus loop filter during a focus-on, as claimed in claims 15-18. In addition, Katayama, *et al.*, and Ishibashi, *et al.* fail to teach or suggest a focus search method that includes adding a waveform for a focus search and a low-pass filtered signal during the focus search, as claimed in claims 15-18. In addition, Katayama, *et al.*, and Ishibashi, *et al.* fail to teach or suggest a focus search method that includes a focus search which starts from a low-pass filtered signal, as claimed in claims 15-18. Accordingly, there is no combination of the references which would provide such teaching or suggestion.

None of the references, taken alone or in combination, teaches or suggests the invention set forth in claims 15-18. Therefore, it is believed that claims 15-18 are allowable over the combination of Hideyasu, Katayama, *et al.*, and Ishibashi, *et al.*, and reconsideration of the rejection of claim 18 under 35 U.S.C. § 103(a) based on Hideyasu, Katayama, *et al.*, and Ishibashi, *et al.* is respectfully requested.

In view of the foregoing remarks, it is believed that, upon entry of this Amendment, all claims pending in the application will be in condition for allowance. Therefore, it is requested that this Amendment be entered and that the case be allowed and passed to issue. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

There are no fees believed due at this time, however, authorization is hereby given to charge Deposit Account No. 501798 for any fees which may be due.

Respectfully submitted,

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